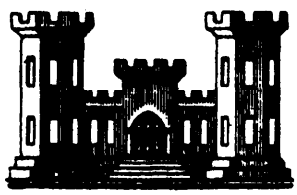
SOUTHEAST NEW HAMPSHIRE WATER RESOURCES STUDY

COMPARISON AND EVALUATION of EARLIER IDENTIFIED RESERVOIR SITES



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.

APRIL 1978

NOTE

Some of the information contained in this report has been derived from data developed by the U.S. Department of Agriculture - Soil Conservation Service as part of the North Atlantic Regional Water Resources Study dated May 1972. The information has been updated to reflect present day costs and has been supplemented by on-site evaluation of each of the earlier identified surface water reservoir locations.

No attempt has been made to evaluate the feasibility of the reservoirs in the development of water supply alternatives to serve the region. The report merely presents the results of those investigations deemed appropriate for consideration of the potential water supply sources.

COMPARISON
AND
EVALUATION
OF
EARLIER IDENTIFIED
RESERVOIR SITES
IN
SOUTHEAST
NEW HAMPSHIRE

Hayden, Harding & Buchanan, Inc.
Consulting Engineers

PURPOSE

It was the purpose of this investigation to review sites proposed for surface supply reservoirs. The review encompassed making a survey of each site, insofar as roadway access permits, to determine site characteristics, developments and general impacts. Each site was evaluated on the basis of engineering, environmental, economic and social aspects.

Construction cost estimates were updated to an Engineering News Record Construction Cost Index of 2600 (Autumn 1977). Data used in establishing the estimates of cost were taken from information developed by the U.S. Department of Agriculture Soil Conservation Service made available by the Corps of Engineers.

It is understood that the information obtained and developed from this investigation is to be used in decision processes regarding near and far term planning. In order to facilitate that decision process, the information has been aggregated into a tabular display.

RESERVOIR CHARACTERISTICS

ASPECTS CONSIDERED:	SALMON FALLS RIVER									COCHECO RIVER									
MINOR DRAINAGE BASIN																			
RESERVOIR NUMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
ENGINEERING																			
DISTANCE TO NEED - MILES	2.5	1.0	4.0	2.5	2.0	1.0	2.0	1.0	2.0	1.5	2.0	4.0	6.5	8.0	7.0	4.0	5.0	2.0	2.0
SAFE YIELD - M.G.D.	3.9	1.3	6.2	1.1	1.6	12.2	2.7	0.8	0.3	8.1	2.1	4.2	4.2	3.4	3.10	4.4	4.0	1.2	15.1
RESERVOIR CONFIGURATION	G	F	G	F	F	E	P	F	G	G	G	F	F	P	G	F	G	F	G
SIZE OF DAM - CY/10^3	140	60	500	180	115	250	70	180	125	780	210	284	540	80	710	22	140	59	300
MULTI-USE POTENTIAL	L	G	F	F	G	E	G	G	L	G	F	G	G	G	G	G	G	G	E
WATER QUALITY - EXISTING	N	N	G	N	N	C	N	N	N	N	G	G	N	N	P	P	P	N	D
WATER QUALITY - PROPOSED	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B
RELOCATIONS - MILES																			
HIGHWAYS																		0.2	1.7
PRIMARY ROADS			0.6										0.3	0.3	2.4		0.3		1.0
SECONDARY ROADS			0.7	0.2	0.75	8.5				0.65	0.4	0.3		0.1	5.2	1.5	1.0	0.9	0.2
RAILROADS	4.5						3.2												2.2
UTILITIES - MILES			0.6	0.2	0.75	4.2				0.65	0.4		0.3	0.3	9.0	1.0	1.7	0.9	2.7
APPURTENANT FACILITIES							S			S				H	S	L			
SITE CONDITIONS	G	G	G	G	F	E	F	F	G	G	G	F	F	F	G	G	G	G	F
ENVIRONMENTAL																			
AREA INUNDATED - ACRES	420	210	560	87	440	1070	285	45	24	860	130	430	423	440	1850	300	440	145	1100
DOWNSTREAM IMPACTS	L	L	L	L	S	H	L	L	L	L	L	L	L	L	M	S	L	L	M
UPSTREAM IMPACTS	L	L	L	L	L	S	N	S	N	S	L	N	L	H	M	L	S	L	M
ECONOMIC																			
CONSTRUCTION COST $1000	713	360	1518	576	608	4272	440	557	428	2211	662	1039	1474	598	2811	377	702	338	3392
RELOCATION COST $1000	1125	50	680	40	193	2410	800	0	0	235	222	30	127	1274	4230	1075	1873	1001	4220
UNIT COST - $1000/MGD	471	315	355	560	501	314	459	696	1427	302	322	275	381	551	229	330	645	1116	372
ANNUAL COST - $1000/YEAR	127	28.3	152	42.5	55.3	264	85.6	38.4	29.5	169	61	73.8	110	129	489	100	178	924	387
SOCIAL																			
ROADWAYS AND UTILITIES	S	N	S	L	S	M	S	N	N	S	H	L	S	S	H	L	L	H	M
COMPETING WATER USE	N	N	N	N	N	S	N	N	N	N	N	N	N	S	S	S	S	N	M
CULTURAL FEATURES DISRUPTED	N	N	L	N	L	H	N	N	N	S	N	N	N	H	H	L	L	N	H
IMPACT OF CONSTRUCTION ON AREA	L	L	L	L	L	L	L	L	S	L	L	L	L	L	L	L	L	L	H
RELOCATED HOMES			15		1	35				4	1			59	157	35	22	24	50
BUSINESSES		1												1	1		2		10
BARNS			9			5				2	1			2	10	1	3	1	5
CEMETERIES			1			*				1									2

ASPECTS CONSIDERED:	LAMPREY RIVER								EXETER RIVER				GREAT AND LITTLE BAYS												COASTAL DRAINAGE				
MINOR DRAINAGE BASIN																													
RESERVOIR NUMBER	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49
ENGINEERING																													
DISTANCE TO NEED - MILES	9.5	7.5	7.5	8.5	7.5	4.5	4.6	2.5	2.0	4.5	4.0	3.5	7.0	8.5	6.0	4.5	5.0	3.5	0.5	5.0	5.0	3.0	1.5	1.5	1.0	3.0	2.0	1.0	2.5	2.0
SAFE YIELD - M.G.D.	2.2	3.7	4.0	2.6	2.7	4.6	3.5	3.5	16.5	3.2	0.9	3.4.6	2.2	0.6	0.9	0.9	0.1	2.1	3.9	1.0	0.4	0.3	0.6	3.7	1.9	0.6	0.7	0.4	0.6	3.4
RESERVOIR CONFIGURATION	G	F	G	G	G	G	F	F	P	G	G	E	F	E	G	F	F	F	G	F	F	F	F	F	P	G	F	F	F	F
SIZE OF DAM - CY/10^3	75	275	260	380	270	70	45	50	55	145	34	380	15	85	26	52	9	36	100	41	50	20	70	65	22	32	5	15	3	19
MULTI-USE POTENTIAL	L	F	G	L	G	G	G	G	E	L	L	E	G	F	F	G	G	G	E	E	F	G	G	E	E	G	E	E	G	E
WATER QUALITY - EXISTING	N	N	P	N	N	G	N	N	N	P	P	D	N	N	N	C	N	O	D	N	N	N	N	P	P	N	N	N	N	N
WATER QUALITY - PROPOSED	B	B	B	B	B	B	B	B	B	B	B	B	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B
RELOCATIONS - MILES																													
HIGHWAYS																			0.5										
PRIMARY ROADS							1.0		0.8			2.8	3.6						0.8				0.4						
SECONDARY ROADS				0.2	0.3		0.3	0.7	4.5			5.2	1.5	2.4				0.1	0.8							0.3	0.3	0.3		0.2
RAILROADS																													
UTILITIES - MILES			0.2	0.6			1.0	0.7	5.3	0.3		4.0	2.6	0.4				0.1	1.6			0.2	1.5	1.8		0.5	0.3	0.1		3.0
APPURTENANT FACILITIES		L	L						S			M	L						H		M		H				H	S		
SITE CONDITIONS	G	F	G	G	G	G	F	P	P	G	G	G	G	E	G	G	G	G	F	G	F	G	F	F	F	G	G	P	F	F
ENVIRONMENTAL																													
AREA INUNDATED - ACRES	130	520	220	190	190	190	230	450	5200	210	125	6550	400	96	135	140	30	170	500	88	66	87	105	570	760	54	460	220	140	840
DOWNSTREAM IMPACTS	L	S	L	L	L	L	L	L	-	L	L	M	L	L	L	H	L	H	M	L	L	S	L	L	L	L	L	L	L	L
UPSTREAM IMPACTS	N	L	S	N	L	S	L	L	H	L	L	M	H	L	L	H	H	L	H	M	L	L	L	S	S	S	S	S	L	L
ECONOMIC																													
CONSTRUCTION COST $1000	377	1076	843	1064	342	409	322	526	1857	574	211	2512	367	358	244	292	121	267	616	246	416	163	327	571	608	543	272	243	153	714
RELOCATION COST $1000	0	0	453	725	0	298	1160	435	4303	45	90	5200	2092	165	0	615	0	96	1340	4000	0	36	202	1321	1127	907	357	209	175	280
UNIT COST - $1000/MGD	171	291	325	688	312	154	483	276	404	193	334	223	1,118	872	271	1008	1210	220	592	9246	1,040	663	482	511	913	2,917	899	2130	547	292
ANNUAL COST - $1000/YEAR	26	742	898	123	58	48.8	107	663	460	42.7	20.8	532	170	36	168	62.6	8.3	32	135	294	287	13.7	36.5	131	120	100	47.7	58.8	22.6	68.6
SOCIAL																													
ROADWAYS AND UTILITIES	N	N	L	L	N	N	H	L	S	L	N	S	M	L	N	N	N	L	M	L	L	L	L	S	L	S	L	L	S	L
COMPETING WATER USE	L	S	L	N	N	L	S	N	N	N	N	S	N	N	L	L	N	H	H	H	L	L	N	N	N	N	N	N	N	N
CULTURAL FEATURES DISRUPTED	N	N	-	N	S	M	N	N	S	N	N	M	H	N	N	L	H	L	L	M	N	N	N	S	L	L	N	N	L	S
IMPACT OF CONSTRUCTION ON AREA	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	S	L	H	L	L	L	L	L	L	L	L	L
RELOCATED HOMES			8			8	5	8	112	1	3	9.6	49	3		16		2	15			1	3	19	23	20	4	11	5	4
BUSINESSES									5			2	2						1	1			1	1				1		
BARNS						5	6	3	13			4	5			1		1	3				2	6	4		1	6		
CEMETERIES									1																				

LEGEND	
A	
B	STATE RIVER WATER
C	QUALITY CLASSIFICATION
D	
E	EXCELLENT
F	FAIR
G	GOOD
H	HIGH
L	LOW OR LIMITED
M	MAJOR
N	NONE
P	POOR
S	SOME OR MODERATE
*	CHURCH

SUMMARY:
ASPECTS OF
RESERVOIR CONSTRUCTION

ASPECTS OF RESERVOIR CONSTRUCTION

General

Pursuant to Work Order No. 3 of Contract DACW 33-77-C-0066, Design of Miscellaneous Facilities and Related Work (1977-1978), Various Locations in New England; aerial and ground reconnaissances have been made of reservoir sites in southeastern New Hampshire. The particular locations investigated were forty-nine sites selected by the Soil Conservation Service (SCS) of the U.S. Department of Agriculture as a portion of the North Atlantic Regional (NAR) Water Resources Study. Data regarding the sizes, volumes, elevations, locations and yields of the various reservoirs were taken from information developed by SCS and made available by the Corps.

Since the depth of investigation possible under the auspices of this study was limited, many aspects of reservoir construction were analyzed on a qualitative rather than a quantitative analysis. Where permitted by the scope of work, quantitative results have been developed and presented. Quantitative results encompass such aspects as houses, barns, and businesses disrupted and roadway, railroad and utilities relocations.

Distance to Areas of Need

The New England Division of the Corps of Engineers in a report upon "Estimated Demands and Resource Availability", dated July 1976, for the Southeast New Hampshire Water Supply Study, defined and estimated future municipal water requirements and present supplies. From these data, the report indicated municipalities where additional supply may be required. Existing Safe Yields, Demand and Deficits for Communities with Public Water Supplies, taken from that report, have been repeated in Figure 1.

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LIST OF FIGURES

ESTIMATED DEMANDS AND RESOURCE AVAILABILITY
SOUTHEAST NEW HAMPSHIRE WATER SUPPLY STUDY
NEW ENGLAND DIVISION CORPS OF ENGINEERS
JULY, 1976

FIGURE I

EXISTING SAFE YIELDS, DEMANDS AND DEFICITS
FOR COMMUNITIES WITH PUBLIC WATER SUPPLIES

Community	Existing Safe Yield (mgd)	1980 Demands Ave Day	1980 Demands Max Day	1980 Deficits Ave Day	1980 Deficits Max Day	1990 Demands Ave Day	1990 Demands Max Day	1990 Deficits Ave Day	1990 Deficits Max Day	2000 Demands Ave Day	2000 Demands Max Day	2000 Deficits Ave Day	2000 Deficits Max Day	2010 Demands Ave Day	2010 Demands Max Day	2010 Deficits Ave Day	2010 Deficits Max Day	2020 Demands Ave Day	2020 Demands Max Day	2020 Deficits Ave Day	2020 Deficits Max Day
Atkinson	0.0	0.30	0.80	0.30	0.80	0.63	1.53	0.63	1.53	0.87	2.02	0.87	2.02	1.08	2.44	1.08	2.44	1.26	2.79	1.26	2.79
Brentwood	0.0	0.0	0.0	0.0	0.0	0.21	0.63	0.21	0.63	0.44	1.12	0.44	1.12	0.69	1.65	0.69	1.65	0.96	2.20	0.96	2.20
Danville	0.0	0.0	0.0	0.0	0.0	0.18	0.51	0.18	0.51	0.28	0.75	0.28	0.75	0.38	0.98	0.38	0.98	0.49	1.23	0.49	1.23
E. Kingston	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.24	0.66	0.24	0.66	0.38	0.98	0.38	0.98	0.56	1.38	0.56	1.38
Fremont	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.36	0.94	0.36	0.94	0.73	1.73	0.73	1.73	1.15	2.57	1.15	2.57
Hampstead	0.0	0.22	0.61	0.22	0.61	0.43	1.09	0.43	1.09	0.62	1.50	0.62	1.50	0.83	1.94	0.83	1.94	1.03	2.34	1.03	2.34
Kensington	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.28	0.75	0.28	0.75	0.41	1.05	0.41	1.05
Kingston	0.0	0.21	0.59	0.21	0.59	0.36	0.94	0.36	0.94	0.49	1.23	0.49	1.23	0.58	1.42	0.58	1.42	0.62	1.50	0.62	1.50
Newton	0.0	0.20	0.56	0.20	0.56	0.41	1.05	0.41	1.05	0.59	1.44	0.59	1.44	0.76	1.80	0.76	1.80	0.95	2.18	0.95	2.18
Plaistow	0.0	0.36	0.94	0.36	0.94	0.56	1.38	0.56	1.38	0.73	1.73	0.73	1.73	0.89	2.06	0.89	2.06	1.05	2.38	1.05	2.38
S. Hampton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.15	0.44	0.15	0.44	0.27	0.73	0.27	0.73	0.42	1.07	0.42	1.07
Stratham	0.0	0.0	0.0	0.0	0.0	0.26	0.71	0.26	0.71	0.55	1.36	0.55	1.36	0.89	2.06	0.89	2.06	1.18	2.63	1.18	2.63
TOTAL	0.0	1.29	3.50	1.29	3.50	3.06	7.84	3.06	7.84	5.32	13.19	5.32	13.19	7.76	18.54	7.76	18.54	10.08	23.32	10.08	23.32
Dover	3.2	3.03	5.98	0.0	2.78	3.60	6.95	0.40	3.75	4.11	7.80	0.91	4.60	4.66	8.70	1.46	5.50	5.09	9.39	1.89	6.19
Durham	1.7	0.95	2.18	0.0	0.48	1.07	2.42	0.0	0.72	1.16	2.59	0.0	0.89	1.49	3.23	0.0	1.53	2.23	4.58	0.53	2.88
Epping	0.09	0.15	0.44	0.06	0.35	0.26	0.71	0.17	0.62	0.44	1.12	0.35	1.03	0.63	1.52	0.54	1.43	0.83	1.94	0.74	1.85
Exeter	4.93	0.91	2.10	0.0	0.0	1.07	2.42	0.0	0.0	1.26	2.79	0.0	0.0	1.40	3.06	0.0	0.0	1.41	3.07	0.0	0.0
Farmington	1.0	0.34	0.89	0.0	0.0	0.39	1.00	0.0	0.0	0.46	1.16	0.0	0.16	0.52	1.29	0.0	0.29	0.57	1.40	0.0	0.40
Greenland	W/Port.	(0.21)	(0.59)	--	--	(0.40)	(1.03)	--	--	(0.64)	(1.55)	--	--	(0.92)	(2.12)	--	--	(1.20)	(2.67)	--	--
Hampton	5.65	2.00	4.60	0.0	0.0	3.32	7.64	0.0	1.99	3.86	8.88	0.0	3.23	4.53	10.42	0.0	4.77	5.08	11.68	0.0	6.03
Milton	0.28	0.12	0.36	0.0	0.08	0.15	0.44	0.0	0.16	0.21	0.59	0.0	0.31	0.26	0.71	0.0	0.43	0.33	0.87	0.05	0.59
New Castle	W/Port.	(0.09)	(0.28)	--	--	(0.11)	(0.71)	--	--	(0.13)	(0.39)	--	--	(0.14)	(0.41)	--	--	(0.14)	(0.41)	--	--
Newfields	0.14	0.05	0.17	0.0	0.03	0.07	0.23	0.0	0.09	0.11	0.33	0.0	0.19	0.18	0.51	0.04	0.37	0.27	0.73	0.13	0.59
Newington	W/Port.	(0.02)	(0.08)	--	--	(0.04)	(0.14)	--	--	(0.06)	(0.20)	--	--	(0.10)	(0.31)	--	--	(0.15)	(0.44)	--	--
New Market	1.50	0.35	0.92	0.0	0.0	0.38	0.98	0.0	0.0	0.41	1.05	0.0	0.0	0.49	1.23	0.0	0.0	0.65	1.57	0.0	0.07
N. Hampton	W/Hamp.	(0.52)	(1.20)	--	--	(0.97)	(2.23)	--	--	(1.37)	(3.15)	--	--	(1.86)	(4.28)	--	--	(2.31)	(5.31)	--	--
Portsmouth	5.30	4.66	8.70	0.0	3.40	5.45	9.97	0.15	4.67	6.37	11.42	1.07	6.12	7.28	12.82	1.98	7.52	7.97	13.87	2.67	8.57
Raymond	0.18	0.21	0.59	0.03	0.41	0.25	0.68	0.07	0.50	0.32	0.85	0.14	0.67	0.40	1.03	0.22	0.85	0.47	1.18	0.29	1.00
Rochester	4.00	2.63	5.29	0.0	1.29	3.03	5.98	0.0	1.98	3.47	6.73	0.0	2.73	3.91	7.47	0.0	3.47	4.38	8.24	0.38	4.24
Rollinsford	0.25	0.14	0.41	0.0	0.16	0.20	0.56	0.0	0.31	0.26	0.71	0.01	0.46	0.34	0.89	0.09	0.64	0.41	1.05	0.16	0.80
Rye	W/Hamp & Port.	(0.49)	(1.37)	--	--	(0.79)	(1.86)	--	--	(1.08)	(2.49)	--	--	(1.34)	(2.94)	--	--	(1.58)	(3.39)	--	--
Salem	1.80	3.06	6.07	1.28	4.27	3.78	7.25	1.98	5.45	4.42	8.31	2.62	6.51	4.68	8.73	2.88	6.93	4.85	9.01	3.05	7.21
Seabrook	1.90	0.89	2.05	0.0	0.15	1.33	3.06	0.0	1.16	1.77	4.07	0.0	2.17	2.11	4.85	0.21	2.95	2.35	4.79	0.45	2.89
Somersworth	3.26	1.67	3.56	0.0	0.30	1.87	3.93	0.0	0.67	2.08	4.31	0.0	1.05	2.35	4.79	0.0	1.53	2.59	5.22	0.0	1.96
Wakefield	0.25	0.16	0.46	0.0	0.21	0.18	0.51	0.0	0.26	0.20	0.56	0.0	0.31	0.21	0.59	0.0	0.34	0.23	0.63	0.0	0.38
TOTAL	35.43	21.34	44.77	1.37	13.91	26.34	54.73	2.77	22.33	30.92	63.27	5.10	30.43	35.44	71.84	7.42	38.55	39.71	79.22	10.34	45.65
GRAND TOTAL	35.43	22.63	48.27	2.66	17.41	29.40	62.57	5.83	30.17	36.24	76.46	10.42	43.62	43.20	90.38	15.18	57.09	49.79	102.54	20.42	68.97

For the purpose of establishing the distance to point of need from the reservoir being studied, this report has considered a point of need to be the major developed area of a town indicated to have an additional water requirement by the year 2020. Distances were measured along the shortest roadway between the dam site and the town.

Dependable Yield

The dependable yield of a reservoir is usually taken to be the average draft rate which can be continuously sustained without fully emptying the reservoir. Many variables enter into a complete analysis of the dependable yield of a given reservoir.

Data presented by the SCS generalized the dependable yield as 80% of the average annual runoff from the tributary drainage area. Data presented herein utilizes storage-yield relationships developed by the Committee on Rainfall and Yield of Drainage Areas of the New England Water Works Association for the Squannacook River at Groton, Massachusetts. These relationships are contained in a progress report of the Committee, a copy of which was made available to us by the Corps of Engineers.

The yield of each reservoir was obtained by computing the storage ratio of the particular reservoir in million gallons of volume per square mile of drainage area. The total water surface area on the drainage basin was then estimated. Reservoir Volume, tributary drainage area and proposed reservoir water surface area were taken from the SCS data. Existing water surfaces were estimated from USGS quadrangle maps. The curves were entered with the above data and a unit yield determined. This was multiplied by the total tributary area to determine the dependable yield of the particular reservoir.

Reservoir Configuration

A reservoir should have a shape that will not enhance short-circuiting of incoming waters and be of such a depth that large areas of shallow flowage are not created, especially around the margins. The topography should be such that there is a high ratio of storage to dam volume.

In assaying the quality of the configuration of a proposed reservoir, this report has considered the following major factors:

1. Expected Raw Water Quality
2. Short-Circuit Potential
3. Proportion of Shallow Area to Total Area
4. Storage-Dam Volume Ratio.

Reservoir Configuration has been rated on a scale from poor (P) to fair (F) to good (G) to excellent (E) depending upon the above considerations.

Size of Dam

The volume of fill required for each dam was taken from data made available from the SCS.

Where additional dikes were considered necessary, dike construction was included under relocation costs.

Multi-Use Potential

In considering multi-use potentials, this report considered the following aspects:

1. Flood Control
2. Boating and Fishing
3. Accessibility
4. Proximity to Population Centers.

Multi-Use Potentials have been rated on a scale from limited or low (L) to fair (F) to good (G) to excellent (E).

Water Quality

Water quality has been reported by the New Hampshire Water Supply and Pollution Control Commission in Staff Report No. 67, Piscataqua River and Coastal New Hampshire Basins Water Quality Management Plan. In that report the existing water quality and classifications of surface waters were presented.

Four general descriptions were used for existing water quality. These were Classes C and D of the state river water quality classification system, suspected or unconfirmed man produced pollution, and no known man-produced pollution. In those areas where monitoring data was not available or considered out of date, no existing water quality was noted.

For the purposes of this report, existing water quality, where classified, has been reported according to the finding. Areas of "suspected pollution" were considered as "poor" (P). Areas of "no known pollution" were considered "good" (G). Areas where no classification has been made were reported as "none" (N).

Future water quality classification is generally planned to be Class B. Certain areas are planned to be Class A. These classifications have been used in the presentation.

Relocations

The length of roadways, utilities and railroads requiring relocation was determined from field and map measurements. The portions considered for relocation were the lengths deemed necessary to be rebuilt to protect against flooding and to provide reasonable approaches.

Appurtenant Facilities

Appurtenant facilities were considered to be those structures not normally considered when assessing a given dam site for construction. Such structures would include dikes, diversions, and other similar specialty items.

For the purpose of this study, dikes have been the only appurtenant facilities considered. The number and extent of diking have been reviewed in relation to the magnitude of the reservoir, and have been rated on a scale from low (L) to some (S) to high (H) to major (M) considerations.

Site Conditions

In assessing site conditions, this report has considered the following aspects:

1. Soil Characteristics
2. Valley Shape
3. Spillway Layout
4. Extent of Swamps and Swales.

Site conditions have been rated on a scale from poor (P) to fair (F) to good (G) to excellent (E).

Area Inundated

The amount of inundation was taken from data made available from the SCS. The area considered was the extent of the maximum flood pool.

Downstream and Upstream Impacts

Downstream and upstream impacts were taken as the amount of disruption which would be caused by the retention of water in the proposed reservoir. The factors considered affected were only those which were obvious from the on-site inspections.

By necessity, the degree of impact of a given reservoir has been made in a qualitative manner using best engineering judgement with available data. Downstream impacts have been rated on a scale from low (L) to some (S) to high (H) to major (M) considerations. Upstream impacts were rated from none (N) to limited (L) to high (H) to major (M).

Costs

Costs of construction for each reservoir have been estimated. The estimates have been separated into two categories: costs associated with the construction of the dam and reservoir and costs associated with the taking of structures and relocation of facilities as a consequence of the impoundment of water.

Cost of embankment and reservoir construction were estimated using curves presented in Appendix F, Upstream Flood Prevention ad Water Management, of the North Atlantic Regional Water Resources Study. The curves present unit costs of construction versus the volume of earth fill and costs of installation services as a percentage of construction cost. The construction cost includes the cost for earth fill, concrete, piping, gates, drains, spillway, etc. Installation services include geologic investigations, surveys, engineering, construction supervision and inspection and administrative overhead.

The cost data presented in the NAR study had been updated to 1970 from PL.566 as built construction costs. For use in this study the curves were advanced to an Engineering News Record Construction Cost Index of 2600. The resulting curves for determining unit embankment costs (Figure 2) and percent cost for installation services (Figure 3) are presented herein.

From the data furnished by the SCS, it was found that the unit cost curve

UNIT EMBANKMENT COST
VS.
VOLUME OF FILL
HAYDEN, HARDING & BUCHANAN INC.
BOSTON, MASS.

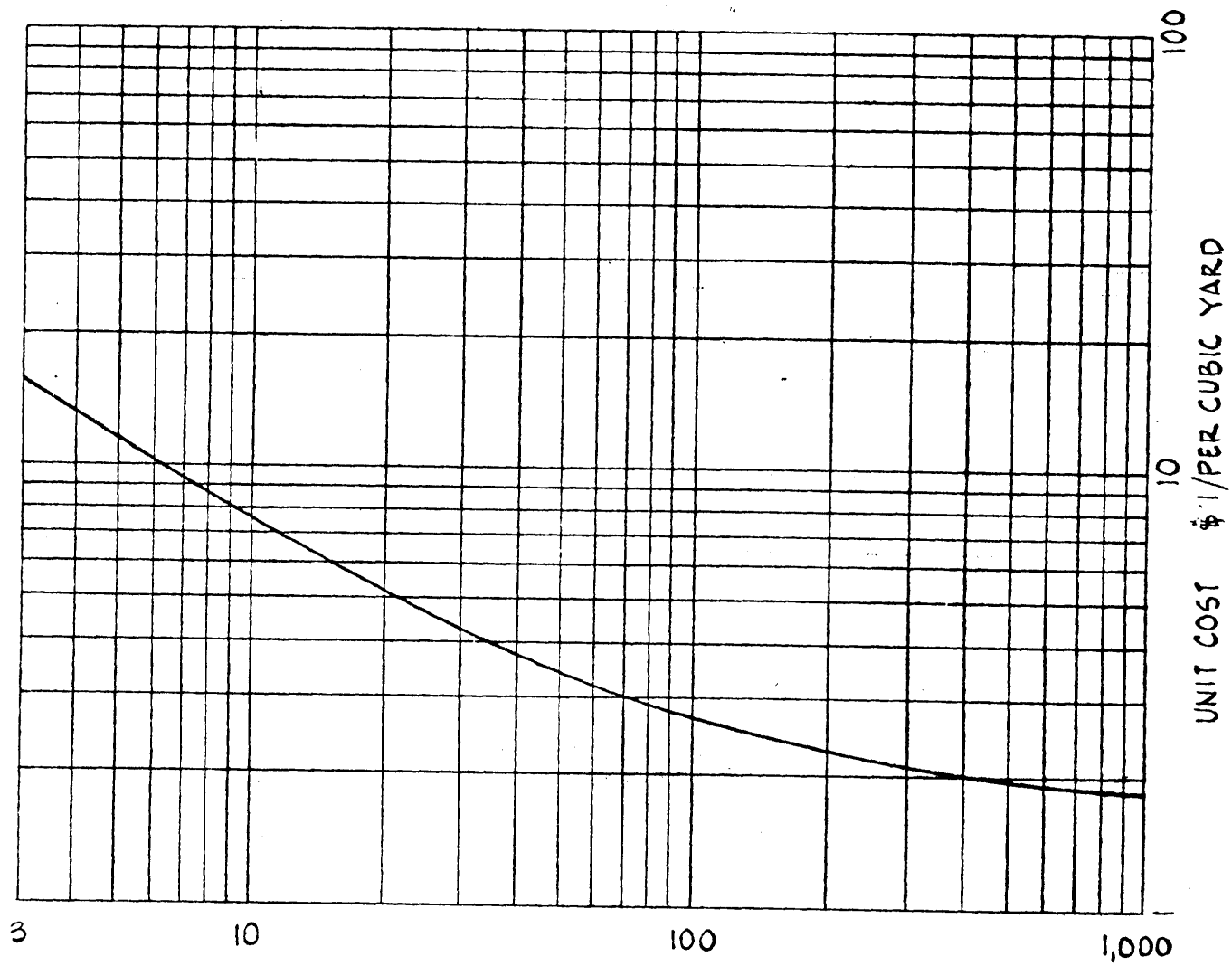

FIGURE 2
ENR = 2600 SEPT. 1977

INSTALLATION COST
VS.
EMBANKMENT COST
HAYDEN, HARDING & BUCHANAN INC.
BOSTON, MASS.

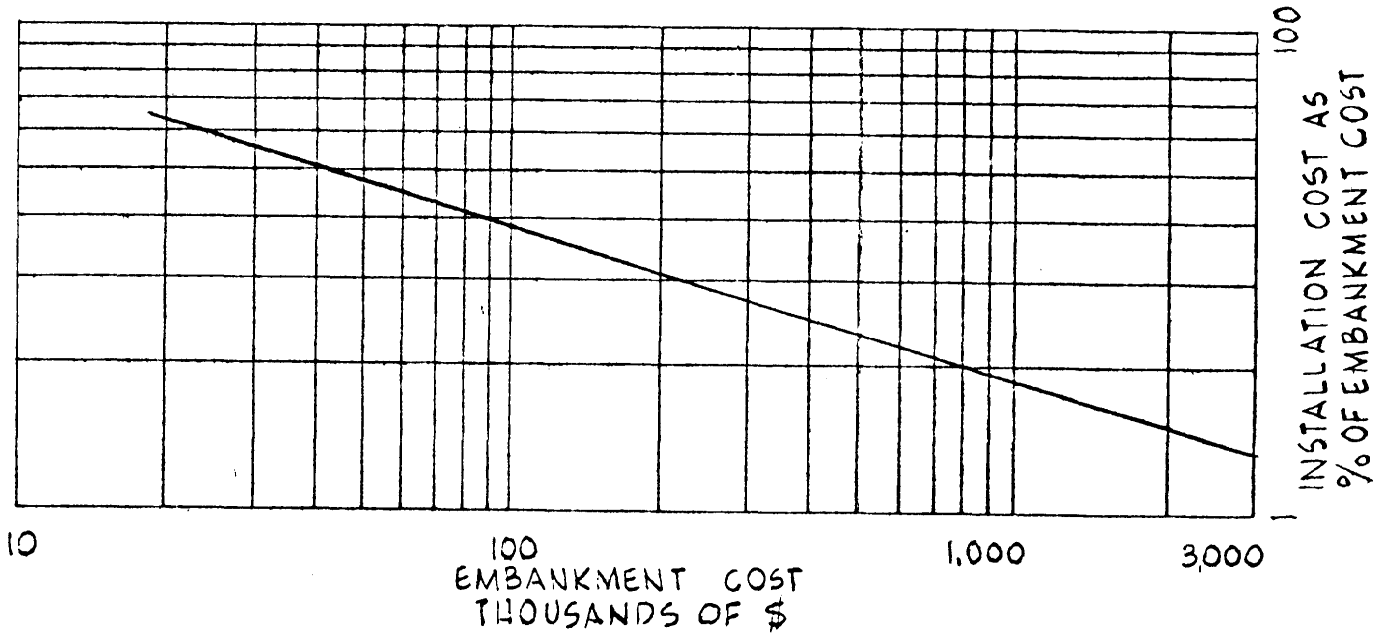

FIGURE 3
ENR = 2000 SEPT. 1977

had not included cost for clearing of the permanent pool. The data further indicated that the 1970 cost for clearing was $400 per acre. Advancing the estimated clearing cost for an ENR Index of 2600, resulted in a unit value of $750 per acre. The area used in the cost computation has been the area of the beneficial pool.

Installation costs have been assumed to have maintained the same percentage relationship to total cost as was the case in the NAR Study. Consequently no change in the position of the installation cost curve was made, however, the curve was extended to cover a wider range.

The costs associated with the taking of structures and relocation of facilities were determined from our on-site survey. Each building or building group was analyzed and an estimate made of the approximate fair market value. Factors were included for land or other real property. Costs of relocation were estimated on the basis of duplication of the existing unit above the reservoir inundation.

Annual payments have been calculated from the total fixed costs estimated. The basis for payments determination has been an amortization over 50 years at 6-5/8% interest.

Social Aspects

The degree of disruption of social aspects caused through roadway and utility relocations or abandonment, allocation of flows with competing water use, inundation of cultural features, and the problems created by the actual dam construction, have been analyzed on a qualitative basis. Disruption of cultural features and relocations from roadways and utilities have been rated on a scale ranging from none (N) to limited or low (L) to some (S) to high (H)

to major (M) disruptions. Competing water usage has been rated on a none-low-some-major (N,L,S,M) scale while the impact of construction was rated on a low-some-high (L,S,H) scale.

The number of homes, businesses, barns and cemeteries within the reservoir area have been assessed individually and enumerated. The reservoir area has been taken as 300 feet horizontally beyond the high water mark. All structures within this taking limit have been considered.. Cemeteries, however, were only considered when they were within the inundated area. The affect on these units have been given a dollar value as described above for relocation costs.

RESERVOIR DESCRIPTIONS

Since the reservoirs investigated under this study vary considerably in size, location and configuration, no attempt has been made to generalize the data pertaining to them. Further, the reservoirs have been analyzed and considered separately. For these reasons, a description of each reservoir has been prepared as a separate dissertation of the conditions found or data made available concerning each particular reservoir.

TOWN: Brookfield RESERVOIR NO.: 1

STREAM: Pike Brook DRAINAGE AREA: 6.89 SQ.MI.

YIELD: 3.9 MGD DAM HEIGHT: 42 FT VOLUME: 140,000 C.Y.

RESERVOIR VOLUME: 6330 ACRE FEET FLOOD AREA: 420 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	0	UTILITIES	0 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	4.5 MILES

DESCRIPTION:

The reservoir site is in an undeveloped area of mixed forest and swamp. The valley narrows at the proposed dam site.

There is a railroad line running through the proposed reservoir site. Approximately 2.4 miles would be within the reservoir but a total of 4.5 miles would be relocated to permit acceptable grades.

There were several homes under construction above the reservoir on the drainage area but no apparent major pollution or water users either above or below the reservoir.

Soils in the area were generally stoney and appeared fairly impervious.

The distance to Sanbornville (Wakefield) is 2.5 miles.

CONSTRUCTION COST: $713,000

RELOCATION COST: $1,125,000

UNIT COST: $471,300/MGD

ANNUAL COST: $127,000 $/year

TOWN: Brookfield RESERVOIR NO.: 2

STREAM: Pike Brook DRAINAGE AREA: 3.40 SQ.MI.

YIELD: 1.3 MGD DAM HEIGHT: 28 FT VOLUME: 60,000 C.Y.

RESERVOIR VOLUME: 1695 ACRE FEET FLOOD AREA: 210 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	0	UTILITIES	0 MILES
BUSINESSES	1	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	0 MILES

DESCRIPTION:

The reservoir is in an undeveloped valley which is forested with some swampy areas. A gravel pit is being worked in the northeast corner above the reservoir site. It is assumed that this pit would eventually be developed within the reservoir areas.

The reservoir configuration is good with the valley narrowing to the proposed dam site. The reservoir, however, would be comparatively broad and shallow (less than 20 feet) encouraging organic growths.

The distance to Sanbornville (Wakefield) is 1.0 miles.

CONSTRUCTION COST: $360,000

RELOCATION COST: $50,000

UNIT COST: $315,400/MGD

ANNUAL COST: $28,300/year

TOWN: Milton and Middleton RESERVOIR NO.: 3

STREAM: Jones Brook DRAINAGE AREA: 11.09 SQ.MI.

YIELD: 6.2 MGD DAM HEIGHT: 63 FT VOLUME: 500,000 C.Y.

RESERVOIR VOLUME: 10,230 ACRE FEET FLOOD AREA: 560 ACRES

WATER QUALITY PROPOSED: B EXISTING: No known man produced pollution

RELOCATIONS:

HOMES	15	UTILITIES	0.6 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	9	PRIMARY ROADS	0.6' MILES
CEMETERIES	1	SECONDARY ROADS	0.7 MILES
		RAILROADS	0 MILES

DESCRIPTION:

The reservoir area is primarily a mixed forest with some fields. Two roads in the upper part of the reservoir would require raising or abandoning. Although a cemetery is shown on the USGS map to be within the inundation, this cemetery was not seen during the on site inspection.

The reservoir site is a wide, deep valley, narrowing to the proposed dam site. Soils in the area appear gravelly and well drained.

An alternate dam site located about 3/4 mile downstream appears also feasible. If a lower water surface were used for either site, the amount of relocation could be reduced or eliminated. There would be some reduction in storage volume due to the lower embankment, but also a corresponding reduction in dam volume and cost.

The distance to Milton is 4.0 miles.

CONSTRUCTION COST: $1,518,000

RELOCATION COST: $680,000

UNIT COST: $354,500/MGD

ANNUAL COST: $152,000/year

TOWN: Brookfield RESERVOIR NO.: 4

STREAM: Hanson Brook DRAINAGE AREA: 7.07 SQ.MI.

YIELD: 1.1 MGD DAM HEIGHT: 46 FT VOLUME: 180,000 C.Y.

RESERVOIR VOLUME: 1620 ACRE FEET FLOOD AREA: 87 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	0	UTILITIES	0.2 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0.2 MILES
		RAILROADS	0 MILES

DESCRIPTION:

The reservoir area is mixed forest with some fields. The site is fairly broad and provides shallow reservoir. The dam site is fairly wide in relation to the reservoir area.

There is a new private dirt road at the southern end of the dam site. Electric power has been installed on the roadway. Although no confirmation could be made during the onsite inspection, it is assumed that a portion of the road will be relocated.

The distance to Sanbornville (Wakefield) is 2.5 miles.

CONSTRUCTION COST: $576,000

RELOCATION COST: $40,000

UNIT COST: $560,000/MGD

ANNUAL COST: $42,500/year

TOWN: Wakefield RESERVOIR NO.: 5

STREAM: Copp Brook DRAINAGE AREA: 3.35 SQ.MI.

YIELD: 1.6 MGD DAM HEIGHT: 27 FT VOLUME: 115,000 C.Y.

RESERVOIR VOLUME: 2734 ACRE FEET FLOOD AREA: 440 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	1	UTILITIES	0.75 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0.75 MILES
		RAILROADS	0 MILES

DESCRIPTION:

The reservoir area is a broad valley of mixed forest with some swamp and fields. The soils in the area appear granular and well drained.

There is a roadway in the upper end of the reservoir which, although not in the area of the beneficial pool would require raising because of flood backwater.

There is one house on the road which is marginally within the prescribed taking limits. The topography of the area is such that one or two feet in elevation could leave the building outside the taking limit.

Downstream of the dam site there are three dwelling units which would not be within the taking area but would be affected by the dam.

The distance to Sanbornvill (Wakefield) is 2 miles.

CONSTRUCTION COST: $608,000

RELOCATION COST: $193,000

UNIT COST: $500,600/MGD

ANNUAL COST: $55,300/year

TOWN: Milton & Wakefield, NH and Acton, ME RESERVOIR NO.: 6

STREAM: Salmon Falls River DRAINAGE AREA: 23.84 SQ. MI.

YIELD: 12.2 MGD DAM HEIGHT: 51 FT. VOLUME 250,000 C.Y.

RESERVOIR VOLUME: 22,000 ACRE FEET, FLOOD AREA: 1070 ACRES

WATER QUALITY PROPOSED: B EXISTING: Class C

RELOCATIONS:

		UTILITIES:	4.2 MILES
HOMES	35	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	5	SECONDARY ROADS	8.5 MILES
CEMETERIES	0(1church)	RAILROADS	0 MILES

DESCRIPTION: The reservoir site is primarily swamp and swale, with some fields and wooded slopes. The reservoir configuation is excellent, though some of the reservoir will be shallow. The wide valley provides a majority of deep areas. The valley narrows to a rocky gorge where the dam would be situated.

There is an existing low dam delow the proposed damsite. This dam may have historical import. It should not be affected by the proposed construction and may even provide a stilling basin for spillway discharges.

Several homes in two states would be affected by construction and low flow augmentation may be necessary to provide dilution water for effluert discharges downstream.

The distance to Milton Mills is 1.0 miles.

CONSTRUCTION COST: $1,422,000

RELOCATION COST: $2,410,000

UNIT COST: $314,000/MGD

ANNUAL COST: $264,400 $/Year

TOWN: Milton RESERVOIR NO.: 7

STREAM: Tributary to Branch River DRAINAGE AREA: 4.84 SQ. MI.

YIELD: 2.7 MGD DAM HEIGHT: 35 FT. VOLUME 70,000 C.Y.

RESERVOIR VOLUME: 4468 ACRE FEET, FLOOD AREA: 285 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	0	UTILITIES:	0 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	3.2 MILES

DESCRIPTION: The reservoir area is a swampy area with forested slopes. There is no apparent building development within the area. There is, however, a railroad, 3.2 miles of which would require being raised.

The southern (upper) end of the reservoir lies on a notch which would have to be diked to contain the backwater from the dam.

The distance to Milton is 2.0 miles.

CONSTRUCTION COST: $440,000

RELOCATION COST: $800,000

UNIT COST: $459,300/MGD

ANNUAL COST: $85,600 $/Year

TOWN: Milton RESERVOIR NO.: 8

STREAM: Miller Brook DRAINAGE AREA: 3.07 SQ. MI.

YIELD: 0.8 MGD DAM HEIGHT: 41 FT. VOLUME 180,000 C.Y.

RESERVOIR VOLUME: 866 ACRE FEET, FLOOD AREA: 45 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES: 0	MILES
HOMES	0	HIGHWAYS 0	MILES
BUSINESSES	0	PRIMARY ROADS 0	MILES
BARNS	0	SECONDARY ROADS 0	MILES
CEMETERIES	0	RAILROADS 0	MILES

DESCRIPTION: The reservoir area is mixed forest and fields. The configuration of the reservoir is average with gradually sloping valley sides.

There is a farm located east and downstream of the damsite. The farm should be beyond the land taking limit.

Also there are several homes to the west of the reservoir area which should be above the taking limit but are indicative of development being undertaken in the area.

The distance to Milton Mills is 1.0 miles.

CONSTRUCTION COST: $557,000

RELOCATION COST: -0-

UNIT COST: $696,300/MGD

ANNUAL COST: $38,400 $/Year

TOWN: Middleton RESERVOIR NO.: 9

STREAM: Tributary to Branch River DRAINAGE AREA: 0.53 SQ. MI.

YIELD: 0.3 MGD DAM HEIGHT: 51 FT. VOLUME 125,000 C.Y.

RESERVOIR VOLUME: 495 ACRE FEET, FLOOD AREA: 24 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	0	UTILITIES:	0 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	0 MILES

DESCRIPTION: Reservoir area is mixed forest. The area is remote and apparently undeveloped.

The reservoir configuration is good being a wide deep valley, narrowing slightly at the damsite.

The proposed reservoir would inundate Bowser Pond.

The distance to Union (Wakefield) is 2.0 miles.

CONSTRUCTION COST: $428,000

RELOCATION COST: -0-

UNIT COST: $1,426,700/MGD

ANNUAL COST: $29,500 $/Year

TOWN: Milton and Farmington RESERVOIR NO.: 10

STREAM: Dames Brook DRAINAGE AREA: 14.39 SQ. MI.

YIELD: 8.1 MGD DAM HEIGHT: 63 FT. VOLUME 780,000 C.Y.

RESERVOIR VOLUME: 13,350 ACRE FEET, FLOOD AREA: 860 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

UTILITIES:	0.65 MILES		
HOMES	4	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	2	SECONDARY ROADS	0.65 MILES
CEMETERIES	1	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is primarily forested with some swampy areas and fields. The reservoir would be fairly deep and broad. The valley, at the damsite, does not narrow significantly.

The elevation of the reservoir is such that the western shore is at the drainage divide. One, possibly two, dikes will be required to retain the backwater.. Aside from the houses and barns in the area, a cemetery having 16 headstones would be inundated.

Reducing the level of the reservoir by about 10 feet would reduce the taking limits sufficiently so that only two or three homes would be affected.

The distance to Farmington is 1.5 miles.

CONSTRUCTION COST: $2,211,000

RELOCATION COST: $235,000

UNIT COST: $302,000/MGD

ANNUAL COST: $169,000 $/Year

TOWN: Farmington RESERVOIR NO.: 11

STREAM: Mad River DRAINAGE AREA: 7.47 SQ. MI.

YIELD: 2.1 MGD DAM HEIGHT: 57 FT. VOLUME 210,000 C.Y.

RESERVOIR VOLUME: 2340 ACRE FEET, FLOOD AREA: 130 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES:	0.4 MILES
HOMES	1	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	1	SECONDARY ROADS	0.4 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forested with some swamp and fields. The reservoir would be fairly deep and broad. The valley narrows significantly at the dam site.

One farm would require taking with another farm in the immediate area of the dam.

One road would require raising, in places by as much as 30 feet.

There are new homes above the reservoir area in the vicinity of Hornetown (Farmington).

The distance to Farmington is 2.0 miles.

CONSTRUCTION COST: $662,000

RELOCATION COST: $222,000

UNIT COST: $421,000/MGD

ANNUAL COST: $ 61,000 $/Year

TOWN: Rochester, Strafford and Farmington RESERVOIR NO.: 12

STREAM: Berrys River DRAINAGE AREA: 7.45 SQ. MI.

YIELD: 4.2 MGD DAM HEIGHT: 47 FT. VOLUME 284,000 C.Y.

RESERVOIR VOLUME: 6880 ACRE FEET, FLOOD AREA: 430 ACRES

WATER QUALITY PROPOSED: A EXISTING: No known Man Produced Pollution

RELOCATIONS:

		UTILITIES: 0	MILES
HOMES	0	HIGHWAYS 0	MILES
BUSINESSES	0	PRIMARY ROADS 0	MILES
BARNS	0	SECONDARY ROADS 0.3	MILES
CEMETERIES	0	RAILROADS 0	MILES

DESCRIPTION: The reservoir area is a broad, deep valley of mixed forest, swamps, fields and a pond. Although the top of dam is wide, the damsite is located on a ridge which reduces the volume of fill required. There is apparently no development on the reservoir.

A small portion of dirt roadway at the upper end of the reservoir may require raising. The degree of involvement will be dependent upon the flood routing and backwater curves for the reservoir.

There are three cemeteries along the west side of the reservoir which, along with farmhouses and barns, should not require taking.

The distance to Rochester is 4.0 miles.

CONSTRUCTION COST: $1,039,000

RELOCATION COST: $30,000

UNIT COST: $254,500/MGD

ANNUAL COST: $73,800 $/Year

TOWN: Strafford RESERVOIR NO.: 13

STREAM: Tributary to Islinglass River DRAINAGE AREA: 7.51 SQ. MI.

YIELD: 4.2 MGD DAM HEIGHT: 66 FT. VOLUME 540,000 C.Y.

RESERVOIR VOLUME: 6920 ACRE FEET, FLOOD AREA: 423 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

UTILITIES:	0.3 MILES		
HOMES	0	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0.3 MILES
BARNS	0	SECONDARY ROADS	0 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is a deep gradually broadening valley. The damsite is located along a ridge to reduce fill requirements. A knoll located above the damsite reduces the storage volume considerably and increases the amount of shallow water. The reservoir area is forested with some swampy areas.

Approximately 0.3 miles of Route 202A at the westend of the dam would require relocation.

The distance to Rochester is 6.5 miles.

CONSTRUCTION COST: $1,474,000

RELOCATION COST: $127,000

UNIT COST: $381,200/MGD

ANNUAL COST: $110,000 $/Year

TOWN: Barrington RESERVOIR NO.: 14

STREAM: Stonehouse Brook DRAINAGE AREA: 6.37 SQ. MI.

YIELD: 3.4 MGD DAM HEIGHT: 42 FT. VOLUME 80,000 C.Y.

RESERVOIR VOLUME: 5872 ACRE FEET, FLOOD AREA: 440 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES:	0.3 MILES
HOMES	59	HIGHWAYS	0 MILES
BUSINESSES	1	PRIMARY ROADS	0.3 MILES
BARNS	2	SECONDARY ROADS	0.1 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is primarily swamp with forested slopes. The majority of the reservoir would be shallow and conducive to organic growth.

Although the damsite is a narrow valley, the elevation of the reservoir is such that two dikes would be needed to retain the backwaters.

The upper end of the reservoir at West Barrington is nearly developed. The taking would involve several homes, a business, and a trailer park.

The distance to Rochester is 8.0 miles.

CONSTRUCTION COST: $598,000

RELOCATION COST: $1,274,000

UNIT COST: $550,600/MGD

ANNUAL COST: $129,000 $/Year

...pump on-off devices.

TOWN: Barrington and Strafford RESERVOIR NO.: 15

STREAM: Isinglass River DRAINAGE AREA: 55.31 SQ. MI.

YIELD: 31.0 MGD DAM HEIGHT: 77 FT. VOLUME 710,000 C.Y.

RESERVOIR VOLUME: 51,135 ACRE FEET, FLOOD AREA: 1850 ACRES

WATER QUALITY PROPOSED: B EXISTING: Suspected Man Produced Pollution

RELOCATIONS:

HOMES	157	UTILITIES:	9.0 MILES
BUSINESSES	1	HIGHWAYS	0 MILES
BARNS	10	PRIMARY ROADS	2.4 MILES
CEMETERIES	0	SECONDARY ROADS	5.2 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forested with fields, swamp and ponded areas. The reservoir would be wide and deep. Two significant dikes would be required to retain the reservoir. The damsite is on a narrow portion of the valley in an area of rock outcrops.

There is significant development under way around Long Pond. New homes are also being constructed elsewhere in the reservoir area.

Impoundment of the Isinglass River could affect sewage effluent dilution in the lower reaches of the Cucheco River.

Along with roadways, approximately 1.4 miles of electric power transmission lines are located within the reservoir area.

The distance to Rochester is 7.0 miles.

CONSTRUCTION COST: $2,811,000

RELOCATION COST: $4,280,000

UNIT COST: $228,700/MGD

ANNUAL COST: $489,000 $/Year

TOWN: Barrington RESERVOIR NO.: 16

STREAM: Isinglass River DRAINAGE AREA: 7.30 SQ. MI.

YIELD: 4.4 MGD DAM HEIGHT: 41 FT. VOLUME 22,000 C.Y.

RESERVOIR VOLUME: 7189 ACRE FEET, FLOOD AREA: 300 ACRES

WATER QUALITY PROPOSED: B EXISTING: Suspected Man Produced Pollution

RELOCATIONS:

		UTILITIES:	1.0	MILES
HOMES	35	HIGHWAYS	0	MILES
BUSINESSES	0	PRIMARY ROADS	0	MILES
BARNS	1	SECONDARY ROADS	1.5	MILES
CEMETERIES	0	RAILROADS	0	MILES

DESCRIPTION: The reservoir area is primarily a narrow, forested gorge. A major portion of the reservoir widens out over swampy areas and would be shallow and would be subject to organic growths. The southern edge of the reservoir will need a low dike to retain the impoundment.

There are houses scattered throughout the reservoir periphery. New developments are in progress on either side of the reservoir in the vicinity of the damsite.

The Barrington town dump is adjacent the southern edge of the reservoir. Although the dump is not in the same drainage basin, leachate is a possibility.

Impoundment of the Isinglass River could affect sewage effluent dilution in the lower reaches of the Cocheco River.

The distance to Rochester is 4.0 miles.

CONSTRUCTION COST: $377,000

RELOCATION COST: $1,075,000

UNIT COST: $330,000/MGD

ANNUAL COST: $100,000 $/Year

TOWN: Rochester and Barrington RESERVOIR NO.: 17

STREAM: Islinglass River DRAINAGE AREA: 8.47 SQ. MI.

YIELD: 4.0 MGD DAM HEIGHT: 53 FT. VOLUME 140,000 C.Y.

RESERVOIR VOLUME: 5995 ACRE FEET, FLOOD AREA: 440 ACRES

WATER QUALITY PROPOSED: B EXISTING: Suspected Man Produced Pollution

RELOCATIONS:

HOMES	22	UTILITIES:	1.7 MILES
BUSINESSES	2	HIGHWAYS	0 MILES
BARNS	3	PRIMARY ROADS	0.3 MILES
CEMETERIES	0	SECONDARY ROADS	1.0 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is a forested valley, with some fields. The valley has steep sides and is fairly narrow. The reservoir would be deep with relatively little shallow areas.

The damsite traverses a ridge which should reduce fill requirements. The soils of the area are granular as evidenced by a number of gravel pits.

A power line traverses the upper portion of the reservoir.

Discharges may be required for dilution of waste effluent.

The distance to Rochester is 5.0 miles.

CONSTRUCTION COST: $702,000

RELOCATION COST: $1,878,000

UNIT COST: $645,00/MGD

ANNUAL COST: $178,000 $/Year

TOWN: Dover RESERVOIR NO.: 18

STREAM: Reyners Brook DRAINAGE AREA: 2.20 SQ MI.

YIELD: 1.2 MGD DAM HEIGHT: 43 FT. VOLUME 59,000 C.Y.

RESERVOIR VOLUME: 2030 ACRE FEET, FLOOD AREA: 145 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES:	0.9 MILES
HOMES	24	HIGHWAYS	0.2 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	1	SECONDARY ROADS	0.9 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is mixed forest with some fields and swamp. The valley has fairly steep sides near the damsite, widening at the upper end. A significant portion of the reservoir would be fairly shallow.

The proposed dam centerline is immediately upstream of an existing impoundment.

There has been significant recent development both on the reservoir area and the immediate vicinity.

A portion of the Spaulding Turnpike traverses the proposed mundation.

The distance to Dover is 2.0 miles.

CONSTRUCTION COST: $338,000

RELOCATION COST: $1,001,000

UNIT COST: $1,115,800/MGD

ANNUAL COST: $92,400 $/Year

TOWN: Rochester and Farmington RESERVOIR NO.: 19

STREAM: Cocheco River DRAINAGE AREA: 35.4 SQ. MI.

YIELD: 15.1 MGD DAM HEIGHT: 55 FT. VOLUME 300,000 C.Y.

RESERVOIR VOLUME: 18,000 ACRE FEET, FLOOD AREA: 1100 ACRES

WATER QUALITY PROPOSED: B EXISTING: Class D

RELOCATIONS:

HOMES	50	UTILITIES:	2.7 MILES
BUSINESSES	10	HIGHWAYS	1.7 MILES
BARNS	5	PRIMARY ROADS	1.0 MILES
CEMETERIES	2	SECONDARY ROADS	0.2 MILES
		RAILROADS	2.2 MILES

DESCRIPTION: The reservoir area is primarily wooded with farmlands and swales. The valley long and relatively narrow. A moderate amount of the reservoir would be shallow. The backwater from flooding would reach into Farmington were flood training walls have been erected.

The damsite is located in an area of granular soils and utilities natural formations to reduce the volume of fill.

There is a significant amount of development along the west and north banks of the reservoir. In addition to the homes and businesses disrupted, portions of a railway, highway, two cemeteries would be relocated.

The proposed reservoir would be next to the Farmington Sewage Treatment facility and two well pumping stations and would inundate the Farmington landfill facility.

Damming the Cocheco River would radically affect the dilution of waste effluent from Rochester and other downstream discharges.

The distance to Rochester is 2.0 miles.

CONSTRUCTION COST: $1,392,000

RELOCATION COST: $4,220,000

UNIT COST: $371,700/MGD

ANNUAL COST: $387,000 $/Year

TOWN: Nottingham and Deerfield RESERVOIR NO.: 20

STREAM: Bean River DRAINAGE AREA: 4.01 SQ. MI.

YIELD: 2.2 MGD DAM HEIGHT: 43 FT. VOLUME 75,000 C.Y.

RESERVOIR VOLUME: 3200 ACRE FEET, FLOOD AREA: 130 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

UTILITIES:	0 MILES		
HOMES	0	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	0	SECONDARY ROADS	0 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forested with some swale. The valley is long and narrow with a flat bottom and steep sides.

The area is inaccessible by road and is apparently undeveloped.

The distance to Epping is 9.5 miles.

CONSTRUCTION COST: $377,000

RELOCATION COST: -0-

UNIT COST: $171,400/MGD

ANNUAL COST: $26,000 $/Year

TOWN: Nottingham and Deerfield RESERVOIR NO.: 21

STREAM: Back Creek DRAINAGE AREA: 7.3 SQ. MI.

YIELD: 3.7 MGD DAM HEIGHT: 57 FT. VOLUME 275,000 C.Y.

RESERVOIR VOLUME: 5850 ACRE FEET, FLOOD AREA: 520 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	0	UTILITIES:	0 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forested with swamps and fields. The valley is long and narrow. The upper area is swampy and would be conducive to organic growths.

There is new development above the west end of the reservoir. There is no apparent development on the reservoir itself.

The proposed foundation would reach to, but not over, two roadways.

The distance to Epping is 7.5 miles.

CONSTRUCTION COST: $1,076,000

RELOCATION COST: -0-

UNIT COST: $290,800/MGD

ANNUAL COST: $74,200 $/Year

TOWN: Deerfield RESERVOIR NO.: 22

STREAM: Lamprey River DRAINAGE AREA: 10.64 SQ. MI.

YIELD: 4.0 MGD DAM HEIGHT: 64 FT. VOLUME 260,000 C.Y.

RESERVOIR VOLUME: 4600 ACRE FEET, FLOOD AREA: 220 ACRES

WATER QUALITY PROPOSED: B EXISTING: Suspect Man Produced Pollution

RELOCATIONS:

		UTILITIES:	0.2 MILES
HOMES	8	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	0	SECONDARY ROADS	0.2 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is virtually all forested lands. The valley is deep and comparatively broad, narrowing at the proposed damsite. The soils in the area appear to be glacial till with some rock outcrops.

There is only one home on the reservoir proper. However, the inundation would reach to the center of Deerfield Parade where the proximity of homes to the stream would require the homes being taken. Also , the reservoir floods out a roadway which provides the only access to Adams Hill.

The distance to Raymond is 7.5 miles.

CONSTRUCTION COST: $848,000

RELOCATION COST: $453,000

UNIT COST: $325,300/MGD

ANNUAL COST: $89,800 $/Year

TOWN: Deerfield RESERVOIR NO.: 23

STREAM: Hartford Brook DRAINAGE AREA: 5.02 SQ. MI.

YIELD: 2.6 MGD DAM HEIGHT: 68 FT. VOLUME 380,000 C.Y.

RESERVOIR VOLUME: 4000 ACRE FEET, FLOOD AREA: 190 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	0	UTILITIES	0.6 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0.3 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forested and swampy with some ponds. The valley is deep and fairly broad.

A portion of an electric power transmission line would require relocation.

There appears to be no development on the reservoir area, however a dirt road traversing the site was being reconstructed.

The distance to Raymond is 8.5 miles.

CONSTRUCTION COST: $1,064,000

RELOCATION COST: $725,000

UNIT COST: $688,100/MGD

ANNUAL COST: $123,000 $/Year

TOWN: Candia RESERVOIR NO.: 24

STREAM: Tributary of North Branch River DRAINAGE AREA: 5.4 SQ. MI.

YIELD: 2.7 MGD DAM HEIGHT: 49 FT. VOLUME 270,000 C.Y.

RESERVOIR VOLUME: 4070 ACRE FEET, FLOOD AREA: 190 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES: 0	MILES
HOMES	0	HIGHWAYS 0	MILES
BUSINESSES	0	PRIMARY ROADS 0	MILES
BARNS	0	SECONDARY ROADS 0	MILES
CEMETERIES	0	RAILROADS 0	MILES

DESCRIPTION: The reservoir area is forested valley with some ponded and swampy areas. The valley sides are fairly steep and do not materially narrow at the damsite.

The reservoir area is apparently undeveloped although a jeep trail is shown on the map. New development is being undertaken in the upper portions of the drainage area.

The distance to Raymond is 7.5 miles.

An alternate damsite which is narrower and slightly higher is located about 1000 ft downstream of the proposed site. This dam would, however, require the taking of two dwellings and relocating about 0.5 miles of unpaved roadway.

CONSTRUCTION COST: $842,000

RELOCATION COST: -0-

UNIT COST: $311,900/MGD

ANNUAL COST: $58,000 $/Year

Model verification

TOWN: Candia RESERVOIR NO.: 25

STREAM: North Branch River DRAINAGE AREA: 14.45 SQ. MI.

YIELD: 4.6 MGD DAM HEIGHT: 50 FT. VOLUME 70,000 C.Y.

RESERVOIR VOLUME: 2300 ACRE FEET, FLOOD AREA: 190 ACRES

WATER QUALITY PROPOSED: B EXISTING: No known Man Produced Pollution

RELOCATIONS:

HOMES	8	UTILITIES:	0 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	5	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is a deep forested valley, which narrows to the proposed damsite. Soils in the area are granular.

The only development is in the extreme upper end of the reservoir, where several buildings would be affected by the backwater. Although the backwater would reach to the roadway at the upper end of the reservoir, the roadway would require relocation.

The distance to Raymond is 4.5 miles.

Dropping the maximum elevation of the proposed reservoir could eliminate affecting any existing structures. This would be accomplished by reducing the elevation of the design pools with a commensurate reduction in storage volume. If storage volume is critical, an alternate damsite 2000 feet downstream could be used with some increase in construction cost.

CONSTRUCTION COST: $409,000

RELOCATION COST: $298,000

UNIT COST: $153,700/MGD

ANNUAL COST: $48,800 $/Year

TOWN: Deerfield RESERVOIR NO.: 26

STREAM: Lamprey River DRAINAGE AREA: 19.5 SQ. MI.

YIELD: 3.5 MGD DAM HEIGHT: 39 FT. VOLUME 45,000 C.Y.

RESERVOIR VOLUME: 3920 ACRE FEET, FLOOD AREA: 230 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	8	UTILITIES:	1.0 MILES
BUSINESSES		HIGHWAYS	MILES
BARNS	6	PRIMARY ROADS	1.0 MILES
CEMETERIES		SECONDARY ROADS	0.3 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forested with some fields and swamps. The valley is shallow and broad, narrowing at the damsite. Site conditions indicate granular soils at the dam. Water depth is very shallow which would promote organic growth.

There is development throughout the reservoir area. The inundation would affect roadways, farms and houses. The most visible item affected would be the Deerfield Fairground.

The distance to Raymond is 4.5 miles.

CONSTRUCTION COST: $322,000

RELOCATION COST: $1,160,000

UNIT COST: $423,400/MGD

ANNUAL COST: $107,000 $/Year

TOWN: Lee, Nottingham and Epping RESERVOIR NO.: 27

STREAM: Tributary to North River DRAINAGE AREA: 6.8 SQ. MI.

YIELD: 3.5 MGD DAM HEIGHT: 33 FT. VOLUME 50,000 C.Y.

RESERVOIR VOLUME: 5450 ACRE FEET, FLOOD AREA: 450 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES:	0.7 MILES
HOMES	8	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	3	SECONDARY ROADS	0.7 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is swamp with forested side slopes and some fields. The amount of organic growth existing within the reservoir area will contribute to reduced raw water quality and will add to organic growths in shallow areas.

There is some development on the periphery of the reservoir, resulting in the need to take dwelling units and relocate or raise unpaved roadways.

The distance to Epping is 3.5 miles.

CONSTRUCTION COST: $526,000

RELOCATION COST: $435,000

UNIT COST: $274,600/MGD

ANNUAL COST: $66,300 $/Year

help prevent the buildup of sediment in the channel by directing and confining the flood flow.

TOWN: Raymond, Chester, Fremont, Danville, Sandown RESERVOIR NO.: 28

STREAM: Exeter River DRAINAGE AREA: 35.9 SQ. MI.

YIELD: 16.5 MGD DAM HEIGHT: 41.5 FT. VOLUME 55,000 C.Y.

RESERVOIR VOLUME: 27,400 ACRE FEET, FLOOD AREA: 3200 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES:	5.3 MILES
HOMES	112	HIGHWAYS	0 MILES
BUSINESSES	5	PRIMARY ROADS	0.8 MILES
BARNS	18	SECONDARY ROADS	4.5 MILES
CEMETERIES	1	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is an extensive swamp with wooded areas and fields. The damsite is a narrow gorge with granular soils and rock outcrops.

A lowdike will be required at the upper end of the reservoir to prevent spillage to the adjacent drainage basin.

The depth of water in the reservoir would be very shallow over a majority of the area. The organic matter existing in the reservoir coupled with the shallow depth would be highly conducive to growths and degredation of raw water quality.

There are new developments spread throughout the reservoir area. The developments vary widely in number and value of housing.

The reservoir would affect several roadways and about 0.75 miles of electric transmission line. One cemetery would require relocation. Also, the Chester Rod and Gun Club would be taken.

The Chester Town Dump is apparently located above the reservoir but within the drainage area.

The distance to Raymond is 2.0 miles.

CONSTRUCTION COST: $1,857,000

RELOCATION COST: $4,808,000

UNIT COST: $403,900/MGD

ANNUAL COST: $460,000 $/Year

TOWN: Sandown and Chester RESERVOIR NO.: 29

STREAM: Exeter River DRAINAGE AREA: 5.80 SQ. MI.

YIELD: 3.2 MGD DAM HEIGHT: 60 FT. VOLUME 145,000 C.Y.

RESERVOIR VOLUME: 4420 ACRE FEET, FLOOD AREA: 210 ACRES

WATER QUALITY PROPOSED: B EXISTING: Suspected Man Produced Pollution

RELOCATIONS:

HOMES	1	UTILITIES:	0.3 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is a forested valley. The valley has steep side slopes which narrow at the proposed dam site. The soils are granular with some neck outcraps.

Only one house is located at the periphery of the reservoir area.

0.3 miles of electric power transmission line traverse the reservoir and would be affected.

The distance to Hampstead is 4.5 miles.

CONSTRUCTION COST: $574,000

RELOCATION COST: $45,000

UNIT COST: $193,400/MGD

ANNUAL COST: $42,700 $/Year

TOWN: Sandown RESERVOIR NO.: 30

STREAM: Exeter River DRAINAGE AREA: 2.16 SQ. MI.

YIELD: 0.9 MGD DAM HEIGHT: 31 FT. VOLUME 34,000 C.Y.

RESERVOIR VOLUME: 1276 ACRE FEET, FLOOD AREA: 125 ACRES

WATER QUALITY PROPOSED: B EXISTING: Suspect Man Produced Pollution

RELOCATIONS:

		UTILITIES:	0 MILES
HOMES	3	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	0	SECONDARY ROADS	0 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is a forested area which is primary inaccessible and apparently undeveloped. The valley is moderately wide and narrows to the proposed damsite. The only development on the reservoir area is located at the upper end of the reservoir. There is some indication of planned development in the upper area.

A roadway in the upper end of the reservoir area will be affected by the backwater but should not require relocation.

The distance to Hampstead is 4.0 miles.

CONSTRUCTION COST: $211,000

RELOCATION COST: $90,000

UNIT COST: $334,400/MGD

ANNUAL COST: $20,800/Year

TOWN: Exeter, Brentwood, Kingston, Earthingston RESERVOIR NO.: 31

STREAM: Exeter River DRAINAGE AREA: 69.2 SQ. MI.

YIELD: 34.6 MGD DAM HEIGHT: 69 FT. VOLUME 380,000 C.Y.

RESERVOIR VOLUME: 52,800 ACRE FEET, FLOOD AREA: 2850 ACRES

WATER QUALITY PROPOSED: B EXISTING: Class D

RELOCATIONS:

HOMES	96	UTILITIES:	0 MILES
BUSINESSES	2	HIGHWAYS	0 MILES
BARNS	4	PRIMARY ROADS	2.8 MILES
CEMETERIES	0	SECONDARY ROADS	5.2 MILES
		RAILROADS	4.0 MILES

DESCRIPTION: The reservoir area is a forested valley with a moderate amount of fields and a few swales. The valley is deep and broad, narrowing significantly at the proposed damsite. The reservoir configuration is excellent with limited area of shallow depth and significant storage volume well above the damsite. The topography is such that dikes will be required on the north side of the reservoir to retain impounded water.

There are significant development throughout the reservoir area. These vary in age, extent and value. Many roadways would be raised and relocated.

Below the damsite are two low dams with fishways for anadromous fish.

The Exeter Town Dump is located adjacent the southern end of the dam centerline. The Kingston Town Dump is located above the southwest corner of the reservoir.

On the Little River, in Kingston, there is a stone dam and several large, old homes. These may have historical interest.

Brentwood, Kingston and East Kingston are all 3.5 to 4.0 miles from the dam site.

CONSTRUCTION COST: $2,512,000

RELOCATION COST: $5,200,000

UNIT COST: $222,900/MGD

ANNUAL COST: $532,000 $/Year

TOWN: Barrington RESERVOIR NO.: 32

STREAM: Mallego Brook DRAINAGE AREA: 4.86 SQ. MI.

YIELD: 2.2 MGD DAM HEIGHT: 32 FT. VOLUME 15,000 C.Y.

RESERVOIR VOLUME: 3707 ACRE FEET, FLOOD AREA: 400 ACRES

WATER QUALITY PROPOSED: A EXISTING: No Classification

RELOCATIONS:

		UTILITIES:	2.6 MILES
HOMES	49	HIGHWAYS	0 MILES
BUSINESSES	2	PRIMARY ROADS	0.6 MILES
BARNS	5	SECONDARY ROADS	1.5 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forest with some fields and swale. The valley is broad and flat, narrowing rapidly to the proposed damsite.

There are developments on the east and north sides of the reservoir area which would be affected. Also affected would be roadways and 0.4 miles of electric power transmission line.

The Barrington Town Dump is located above the reservoir on the drainage area.

A dike may be required on the southwest edge of the reservoir.

The distance to Dover is 7.0 miles.

CONSTRUCTION COST: $367,000

RELOCATION COST: $2,092,000

UNIT COST: $1,117,700/MGD

ANNUAL COST: $170,000 $/Year

TOWN: Barrington RESERVOIR NO.: 33

STREAM: Tributary to Mallego Brook DRAINAGE AREA: 1.28 SQ. MI.

YIELD: 0.6 MGD DAM HEIGHT: 44 FT. VOLUME 85,000 C.Y.

RESERVOIR VOLUME: 976 ACRE FEET, FLOOD AREA: 96 ACRES

WATER QUALITY PROPOSED: A EXISTING: No Classification

RELOCATIONS:

UTILITIES:	0.4 MILES		
HOMES	3	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	0	SECONDARY ROADS	0.4 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forested with some fields, and swale. The valley is irregular and narrows significantly at the proposed damsite.

The only development on the reservoir area appears to be at the upper end. There are new developments nearby whichare not in the drainage area.

The damsite is excellent with a great deal of edge outcrop.

The distance to Dover is 8.5 miles.

CONSTRUCTION COST: $358,000

RELOCATION COST: $165,000

UNIT COST: $871,700/MGD

ANNUAL COST: $36,000 $/Year

TOWN: Barrington RESERVOIR NO.: 34

STREAM: Oyster River DRAINAGE AREA: 1.85 SQ. MI.

YIELD: 0.9 MGD DAM HEIGHT: 33 FT. VOLUME 26,000 C.Y.

RESERVOIR VOLUME: 1411 ACRE FEET, FLOOD AREA: 135 ACRES

WATER QUALITY PROPOSED: A EXISTING: No Classification

RELOCATIONS:

UTILITIES:	0 MILES		
HOMES	0	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	0	SECONDARY ROADS	0 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forested with swales. The reservoir is in a broad valley which narrows at the damsite.

The reservoir area is inaccessible and apparently has no development. There are new developments on the drainage area above the reservoir.

The distance to Durham is 5.0 miles.

CONSTRUCTION COST: $244,000

RELOCATION COST: -0-

UNIT COST: $271,100/MGD

ANNUAL COST: $16,800 $/Year

TOWN: Barrington RESERVOIR NO.: 35

STREAM: Caldwell Brook DRAINAGE AREA: 2.13 SQ. MI.

YIELD: 0.9 MGD DAM HEIGHT: 36 FT. VOLUME 52,000 C.Y.

RESERVOIR VOLUME: 1170 ACRE FEET, FLOOD AREA: 140 ACRES

WATER QUALITY PROPOSED: A EXISTING: Class C

RELOCATIONS:

		UTILITIES:	0 MILES
HOMES	16	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	1	SECONDARY ROADS	0 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is swale with wooded side slopes. The valley is broad and level narrowing at the proposed damsite.

There are significant amounts of development on either end of the proposed dam.

The distance to Durham is 4.5 miles.

CONSTRUCTION COST: $292,000

RELOCATION COST: $615,000

UNIT COST: $1,007,800/MGD

ANNUAL COST: $62,600 $/Year

TOWN: Lee RESERVOIR NO.: 36

STREAM: Tributary to Wheelwright Pond DRAINAGE AREA: 0.22 SQ. MI.

YIELD: 0.1 MGD DAM HEIGHT: 20 FT. VOLUME 9,000 C.Y.

RESERVOIR VOLUME: 168 ACRE FEET, FLOOD AREA: 30 ACRES

WATER QUALITY PROPOSED: A EXISTING: No Classification

RELOCATIONS:

		UTILITIES: 0	MILES
HOMES	0	HIGHWAYS 0	MILES
BUSINESSES	0	PRIMARY ROADS 0	MILES
BARNS	0	SECONDARY ROADS 0	MILES
CEMETERIES	0	RAILROADS 0	MILES

DESCRIPTION: The reservoir area is a forested valley. The valley forms a basin with a narrow outlet where the dam would be situated.

There are no apparent developments on the reservoir area. However, the Lee Town Land Fill is located above the reservoir on the drainage area.

The distance to Durham is 5.0 miles.

CONSTRUCTION COST: $121,000

RELOCATION COST: -0-

UNIT COST: $1,210,000/MGD

ANNUAL COST: $8,300 $/Year

TOWN: Lee and Madbury RESERVOIR NO.: 37

STREAM: Oyster River DRAINAGE AREA: 5.34 SQ. MI.

YIELD: 2.1 MGD DAM HEIGHT: 48 FT. VOLUME 36,000 C.Y.

RESERVOIR VOLUME: 2160 ACRE FEET, FLOOD AREA: 170 ACRES

WATER QUALITY PROPOSED: A EXISTING: Class D

RELOCATIONS:

		UTILITIES:	0.1 MILES
HOMES	2	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	1	SECONDARY ROADS	0.1 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forested with some fields. The valley is long and narrow, resulting in a relatively small dam volume in relation to the storage.

An electric power transmission line crosses the reservoir. About 0.1 mile would be affected.

The distance to Durham is 3.5 miles.

CONSTRUCTION COST: $267,000

RELOCATION COST: $196,000

UNIT COST: $220,500/MGD

ANNUAL COST: $32,000 $/Year

TOWN: Durham, Lee and Madbury RESERVOIR NO.: 38

STREAM: Oyster River DRAINAGE AREA: 7.80 SQ. MI.

YIELD: 3.9 MGD DAM HEIGHT: 47 FT. VOLUME 100,000 C.Y.

RESERVOIR VOLUME: 5945 ACRE FEET, FLOOD AREA: 500 ACRES

WATER QUALITY PROPOSED: A EXISTING: Class D

RELOCATIONS:

		UTILITIES:	1.6 MILES
HOMES	15	HIGHWAYS	0.5 MILES
BUSINESSES	1	PRIMARY ROADS	0.8 MILES
BARNS	3	SECONDARY ROADS	0.8 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is approximately equal parts fields and forest with a few small swales. The valley is broad and level. Extensive areas would be shallow and, hence, conducive to organic growths.

Development is distributed throughout the reservoir area. Concentrated housing and industrial developments are being erected in the vicinity of the reservoir.

Two dikes would be required to retain the backwaters. About 1.6 miles of new Route 4 would require raising and 0.6 miles of telephone line are affected.

A stream gaging station would be inundated.

The distance to Durham is 0.5 miles.

CONSTRUCTION COST: $616,000

RELOCATION COST: $1,340,000

UNIT COST: $501,500/MGD

ANNUAL COST: $135,000 $/Year

TOWN: Madbury and Dover RESERVOIR NO.: 39

STREAM: Johnson Creek DRAINAGE AREA: 2.10 SQ. MI.

YIELD: 1.0 MGD DAM HEIGHT: 42 FT. VOLUME 41,000 C.Y.

RESERVOIR VOLUME: 1230 ACRE FEET, FLOOD AREA: 88 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	0	UTILITIES:	0 MILES
BUSINESSES	1	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is wooded with fields and a few swales. The valley is fairly narrow with steep sides. The valley narrows slightly at the damsite.

There is only one development on the reservoir area although there are new developments in the drainage basin. The lone development is, however, the Portsmouth, N.H. Water Treatment Plant at Madbury. This facility treats water from the Bellany Reservoir and transmits it to Portsmouth. The plant has three well houses located in Johnson Creek which supplement surface supplies.. Effluents from the facility are discharged to Johnson Creek.

The distance to Durham is 5.0 miles.

An alternative site could be developed upstream of the water treatment plant with corresponding reduction in storage and yeild. The wells at the plant would also be affected.

CONSTRUCTION COST: $246,000

RELOCATION COST: $4,000,000

UNIT COST: $4,246,000/MGD

ANNUAL COST: $294,000 $/Year

TOWN: Durham RESERVOIR NO.: 40

STREAM: Unnamed Brook DRAINAGE AREA: 0.70 SQ. MI.

YIELD: 0.4 MGD DAM HEIGHT: 42 FT. VOLUME 50,000 C.Y.

RESERVOIR VOLUME: 534 ACRE FEET, FLOOD AREA: 66 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	0	UTILITIES:	0 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forested with some swamps. The valley is ill defined, broad and uneven. The soils appear to be glacial till with many rock outcroppings. The valley terrain is such that eight dikes of various lengths and heights would be necessary to retain the backwater.

Although new homes are being erected in the vicinity there is no apparent development on the reservoir area.

The distance to Durham is 5.0 miles.

CONSTRUCTION COST: $416,000

RELOCATION COST: -0-

UNIT COST: $1,040,000/MGD

ANNUAL COST: $28,700 $/Year

TOWN: Stratham RESERVOIR NO.: 41

STREAM: Brackett Brook DRAINAGE AREA: 0.55 SQ. MI.

YIELD: 0.3 MGD DAM HEIGHT: 22 FT. VOLUME 20,000 C.Y.

RESERVOIR VOLUME: 419 ACRE FEET, FLOOD AREA: 87 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	1	UTILITIES:	0 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is wooded with a few fields. The valley is broad and flat, narrowing at the damsite. Soils appear to be granular.

There are new developments being under taken both upstream and downstream of the reservoir. However, the only dwelling unit affected directly by the reservoir is a home located at the southeastern end of the dam center line. Relocation of the proposed centerline, while increasing the fill volume, could eliminate the need for taking this home.

The distance to Stratham is 3.0 miles.

CONSTRUCTION COST: $163,000

RELOCATION COST: $36,000

UNIT COST: $663,300/MGD

ANNUAL COST: $13,700 $/Year

TOWN: Greenland and Stratham RESERVOIR NO.: 42

STREAM: Thompson Brook DRAINAGE AREA: 1.20 SQ. MI.

YIELD: 0.6 MGD DAM HEIGHT: 37 FT. VOLUME 70,000 C.Y.

RESERVOIR VOLUME: 916 ACRE FEET, FLOOD AREA: 105 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES:	0.2 MILES
HOMES	3	HIGHWAYS	0 MILES
BUSINESSES	1	PRIMARY ROADS	0 MILES
BARNS	2	SECONDARY ROADS	0 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is forested with some fields and swale. The valley is broad and narrows at the proposed damsite. The reservoir would be fairly deep with relatively little shallow area. Topography is such that two dikes would be required to retain the backwater.

There is little development in the reservoir area itselt since the properties are farms or a trailer camp. However there are several new homes in the area. About 0.2 miles of electric power transmission line, traversing the reservoir, would be affected.

The distance to Greenland is 1.5 miles.

CONSTRUCTION COST: $327,000

RELOCATION COST: $202,000

UNIT COST: $881,700/MGD

ANNUAL COST: $36,500 $/Year

TOWN: Greenland, Stratham, and North Hampton RESERVOIR NO.: 43

STREAM: Winnicut River DRAINAGE AREA: 7.31 SQ. MI.

YIELD: 3.7 MGD DAM HEIGHT: 36 FT. VOLUME 65,000 C.Y.

RESERVOIR VOLUME: 5567 ACRE FEET, FLOOD AREA: 570 ACRES

WATER QUALITY PROPOSED: B EXISTING Suspected Man Produced Pollution

RELOCATIONS:

HOMES	19	UTILITIES:	1.5 MILES
BUSINESSES	1	HIGHWAYS	0 MILES
BARNS	6	PRIMARY ROADS	0.4 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is about equal parts fields and woods with some ponded areas and swale. The valley is level and broad with meandering streams. The major portion of the reservoir area would be quite shallow (less than 15 ft depth) which would support aquatic growths.

There is new housing construction along all of the existing roadways in the reservoir area. Also affected would be 1.1. miles of power transmission line.

At the upper end of the reservoir, at Winnicut Mills, there is a breached stone dam which may be historical value.

The distance to Greenland is 1.5 miles.

CONSTRUCTION COST: $571,000

RELOCATION COST: $1,321,000

UNIT COST: $511,400/MGD

ANNUAL COST: $131,000 $/Year

TOWN: North Hampton and Hampton RESERVOIR NO.: 44

STREAM: Winnicut River DRAINAGE AREA: 4.72 SQ. MI.

YIELD: 1.9 MGD DAM HEIGHT: 22 FT. VOLUME 20,000 C.Y.

RESERVOIR VOLUME: 3596 ACRE FEET, FLOOD AREA: 760 ACRES

WATER QUALITY PROPOSED: B EXISTING: Suspected Man Produced Pollution

RELOCATIONS:

HOMES	23	UTILITIES:	1.8 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	4	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is mostly swamp with wooded areas and open fields. The valley is broad and very flat, narrowing to a small opening at the damsite. The depth of water is very shallow which will be conducive to aquatic growths.

Dikes are required at two points to retain the impoundment. At these points, highways have been built so that the dikes operation should only be rerouting of the highway drainage.

1.8 miles of power transmission line along side the highway would be affected but should not need relocation.

Many dwelling units have been considered as being within the land taking limits. Due to the flat terrain and limited topographic data available, a small change in elevation would have a significant change on the affected area. Therefore, more accurate data is needed to fully assess the need for relocation of a unit.

The distance to North Hampton is 1.0 miles.

CONSTRUCTION COST: $608,000

RELOCATION COST: $1,127,000

UNIT COST: $913,200/MGD

ANNUAL COST: $120,000/Year

TOWN: Hampton, Hampton Falls & Exeter RESERVOIR NO.: 45

STREAM: Ash Brook DRAINAGE AREA: 1.25 SQ. MI.

YIELD: 0.6MGD DAM HEIGHT: 30 FT. VOLUME 32,000 C.Y.

RESERVOIR VOLUME: 620 ACRE FEET, FLOOD AREA: 54 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

HOMES	20	UTILITIES:	0.55 MILES
BUSINESSES	0	HIGHWAYS	0 MILES
BARNS	0	PRIMARY ROADS	0 MILES
CEMETERIES	0	SECONDARY ROADS	0.3 MILES
		RAILROADS	0 MILES

DESCRIPTION: The reservoir area is wooded with some open areas. The valley is narrow with moderately steep slopes. The soils are granular. and well drained.

There are new developments on the east and north shores which encroach on the reservoir area. Approximately 0.2 miles of power transmission line which traverses the damsite would require relocation.

The distance to Hampton is 3.0 miles.

CONSTRUCTION COST: $543,000

RELOCATION COST: $907,000

UNIT COST: $2,416,700/MGD

ANNUAL COST: $100,000 $/Year

TOWN: Hampton Falls and Kensington RESERVOIR NO.: 46

STREAM: Taylor River DRAINAGE AREA: 1.96 SQ. MI.

YIELD: 0.7 MGD DAM HEIGHT: 13 FT. VOLUME 5,000 C.Y.

RESERVOIR VOLUME: 900 ACRE FEET, FLOOD AREA: 460 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES:	0.3 MILES
HOMES	4	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	1	SECONDARY ROADS	0.3 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area has about equal parts woods and fields with significant area of swamp and swale. The valley is flat and broad, narrowing radically at the proposed damsite.

The shallow water depth will be conducive to aquatic growths.

Two dikes would be required at retain the backwater.

There is an existing stone dam downstream of the proposed structure.

The distance to Kensington is 2.0 miles.

CONSTRUCTION COST: $272,000

RELOCATION COST: $357,000

UNIT COST: $898,600/MGD

ANNUAL COST: $47,700 $/Year

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TOWN: Kensington RESERVOIR NO.: 47

STREAM: Winkley Brook DRAINAGE AREA: 1.1 SQ. MI.

YIELD: 0.4 MGD DAM HEIGHT: 15 FT. VOLUME 15,000 C.Y.

RESERVOIR VOLUME: 646 ACRE FEET, FLOOD AREA: 220 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES:	0.1 MILES
HOMES	11	HIGHWAYS	0 MILES
BUSINESSES	1	PRIMARY ROADS	0 MILES
BARNS	6	SECONDARY ROADS	0.3 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is swamp with wooded slopes and some fields. The valley is flat and irregular. The shallow water depth will be condusive to aquatic growths. The topography is such that dikes will be required at three locations.

The distance to Kensington is 1.0 miles.

CONSTRUCTION COST: $243,000

RELOCATION COST: $609,000

UNIT COST: $2,130,000/MGD

ANNUAL COST: $58,800 $/Year

TOWN: Hampton Falls RESERVOIR NO.: 48

STREAM: Hampton Falls River DRAINAGE AREA: 1.25 SQ. MI.

YIELD: 0.6 MGD DAM HEIGHT: 11 FT. VOLUME 3,000 C.Y.

RESERVOIR VOLUME: 735 ACRE FEET, FLOOD AREA: 140 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES:	0 MILES
HOMES	5	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	0	SECONDARY ROADS	0 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is mostly wooded with some fields. The valley is broad and branched. The sides of the valley narrow at the proposed damsite. The shallow depth of water will be conducive to aquatic growths.

A new roadway traverses the impoundment. The elevation of the road is such that additional raising would be unnecessary.

There are new homes and businesses being erected in the area. There are homes developed on the north side of the proposed reservoir.

The distance to Seabrook is 2.5 miles.

CONSTRUCTION COST: $153,000

RELOCATION COST: $175,000

UNIT COST: $546,700/MGD

ANNUAL COST: $22,600 $/Year

TOWN: Hampton and Hamptoh Falls RESERVOIR NO.: 49

STREAM: Taylor River DRAINAGE AREA: 8.61 SQ. MI.

YIELD: 3.4 MGD DAM HEIGHT: 28 FT. VOLUME 19,000 C.Y.

RESERVOIR VOLUME: 4100 ACRE FEET, FLOOD AREA: 840 ACRES

WATER QUALITY PROPOSED: B EXISTING: No Classification

RELOCATIONS:

		UTILITIES:	3.0 MILES
HOMES	4	HIGHWAYS	0 MILES
BUSINESSES	0	PRIMARY ROADS	0 MILES
BARNS	0	SECONDARY ROADS	0.2 MILES
CEMETERIES	0	RAILROADS	0 MILES

DESCRIPTION: The reservoir area is swale with some fields and wooded areas. The valley is broad and flat with meandering streams. The valley narrows at the proposed damsite. The extensive areas of shallow depth will be conducive to aquatic growths.

Electric power transmission lines traverse the reservoir area and will require relocation.

An alternate dam centerline location slightly upstream of that proposed would eliminate the need for taking two of the homes within the proposed reservoir area.

There is an existing stone dam at Coffins Mill downstream of the proposed dam location. This may have historical import.

The distance to Hampton is 2.0 miles.

CONSTRUCTION COST: $714,000

RELOCATION COST: $280,000

UNIT COST: $292,400/MGD

ANNUAL COST: $68,600 $/Year